

**R**enowned physical oceanographer and AMS Fellow Bruce A. Warren died suddenly on 2 September 2010, at the age of 73, while vacationing in Provincetown, Massachusetts. His work significantly advanced the field of physical oceanography in areas including the dynamics of the ocean general circulation; large-scale water-property distributions; and the deep circulation of the World Ocean, especially deep boundary currents.

**BRUCE A. WARREN**  
1937–2010

Bruce did his undergraduate study at Amherst College, finishing in 1958. During this time, his freshman physics professor, Arnold Aarons, steered him to a summer job at the Woods Hole Oceanographic Institution (WHOI), where he was to assist Henry Stommel. Halfway through that summer, Bruce found himself working at sea beside Fritz Fuglister on the research vessel *Atlantis*. Bruce discovered then that he loved seagoing oceanography. As he noted in his response to being awarded the American Geophysical Union’s Maurice Ewing Medal in 2004 (he was also an AGU Fellow), these three individuals had a dominant influence on his professional life.

Bruce went on to earn his Ph.D. in physical oceanography from the Massachusetts Institute of Technology in 1962. During that time, Stommel and Aarons were formulating their famous dynamical framework for the deep-ocean circulation, a frequent touchstone for Bruce as he worked in the Department of Physical Oceanography at WHOI. He spent his entire professional career there, advancing to senior scientist by 1978. He dedicated much of that time to exploring and explicating the deep circulation of the World Ocean, often using or expanding upon the Stommel-Aarons framework.

Bruce was primarily responsible for discovery, analysis, and dynamical interpretation of multiple deep currents throughout the World Ocean. In recognition of his scientific achievements, the AMS in 2010 awarded Bruce the Sverdrup Gold Medal “for advancing our understanding of the general

circulation of the ocean through observations and dynamical interpretation.” He remained active at WHOI as a scientist emeritus from his retirement in 2003 up to his passing.

Bruce was in his element at sea—a meticulous observationalist and an excellent shipmate. He took and demanded highly accurate and precise observations. For example, at the start of cruises he would orchestrate a competition to determine quantitatively who among the watch-standers could best draw water samples for dissolved oxygen analyses. When not at work, Bruce could often be found on deck, smoking his beloved pipe. He once said “I like to go to sea and I like the company of people who like to go to sea.” Those fortunate enough to sail with him might find themselves enjoying relaxed but stimulating conversations with him on diverse topics including aspects of history, gardening, ornithology, or literature, perhaps while contemplating the sunset after dinner on a quiet evening.

While Bruce’s seagoing observational efforts are too numerous to detail in their entirety, his heroic service as a principle architect of the 1994–1996 Indian Ocean Expedition of the World Ocean Circulation Experiment (WOCE) certainly bears mention. He served on the organizing and steering committees for WOCE Indian Ocean activities, largely authored the program design document, spearheaded the expedition coordination, and chaired the science workshop that followed. He spent significant time at sea during this ambitious and comprehensive single-ship oceanographic survey of the Indian Ocean, and later authored scientific papers analyzing some of the remarkable data collected.

On shore, Bruce would deliberate long and hard while seeking to understand and synthesize the observations he had collected at sea. He accomplished these tasks with the aid of his pipe, rocking chair, drafting table, and pencil-and-paper. Notably, Bruce brought rigorous dynamics to bear as a tool for complete understanding of the data. He was also a firm believer in contouring vertical-lateral sections of ocean water



**Bruce A. Warren**

**TELEVISION SEALS OF APPROVAL**

<b>1854</b>	<b>Jana Lynae Pahmiyer</b>	<b>2010</b>
<b>1855</b>	<b>Trevor Adams</b>	<b>2010</b>
<b>1856</b>	<b>Tina Pietrondi</b>	<b>2010</b>
<b>1857</b>	<b>Christopher Knowles</b>	<b>2010</b>

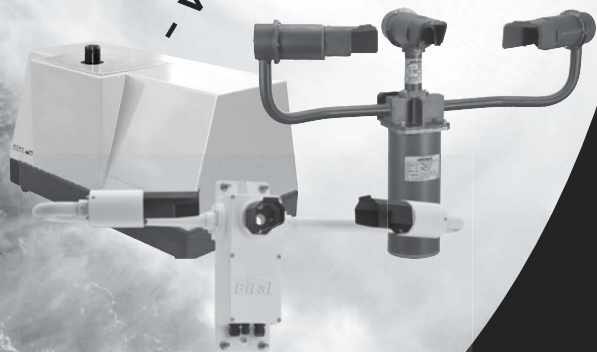
# ATMOSPHERIC Measurement Instruments for

ice crystal formation  
and cloud physics

atmospheric biological  
aerosol investigation

precipitation, haze, fog  
EXCO and visibility

- aerosol size + shape  
- aerosol fluorescence  
- visibility + precipitation



**Biral**

[www.biral.com/bams](http://www.biral.com/bams)

email: [bams@biral.com](mailto:bams@biral.com)

properties by hand as one step in examining and interpreting the data. But he was not a solitary scientist. For many years, Bruce could be found gathered with colleagues in the Clark Laboratory reading room at 10:00 a.m. or 3:00 p.m. for a coffee break and varied—often erudite—conversations, but also sometimes for sea stories. His hearty laugh resounded often through the Clark hallways.

Bruce was a careful practitioner and fierce advocate of clear and concise exposition, as demonstrated by his scientific publications (at least 53 of them refereed) and his editorial service. He loved language and words. The original and insightful scientific content of his publications, as well as their masterful composition, ensures their enduring usefulness. Bruce was editor of at least three volumes, including (with Carl Wunsch) the classic *Evolution of Physical Oceanography: Scientific Surveys in Honor of Henry Stommel*. He was a conscientious and careful coeditor of the *Journal of Physical Oceanography* from 1980 to 1985, as well as a legendary reviewer. Many greatly benefited from his editorial advice and guidance.

Bruce had numerous interests outside of science and the sea, including history, gardening, literature, chamber music, and art. He was an avid naturalist who kept an illustrated notebook on Cape Cod wildflowers. He was also an epicure—fond of a well-prepared meal, a stiff drink, and good company. He wrote a chapter titled “Bars of Woods Hole” for the book, *Woods Hole Reflections*, and an article regarding geographical variations in gin-and-tonic garnishing customs titled “The Lemon-and-Lime Line: I. Appeal for data” in the unrefereed *Journal of Correct Oceanography* (1983, vol. 2, no. 1). Many colleagues enjoyed memorable and excellent meals with him prior to cruises or in conjunction with meetings, such as prawns piri piri in Mombassa, Peking duck in Singapore, Dungeness crab in San Francisco, or turtle soup in New Orleans. He valued his colleagues and enjoyed their society. He will be long remembered and sorely missed for his excellent science, varied interests, and amiable comradeship.

—GREGORY C. JOHNSON, JOHN M. TOOLE,  
W. BRECHNER OWENS, KEVIN G. SPEER,  
AND JOSEPH H. LACASSE